

Claims

1. A low noise amplifier used for an RF (Radio Frequency) receiver having an antenna, an input tuner, an amplifier and a detector, the low noise amplifier comprising:
5 an RF amplification control circuit unit for controlling an amplification of an RF signal depending on an electric field intensity of the RF signal;
a low noise amplification circuit unit for amplifying
10 the RF signal under control of the RF amplification control circuit unit; and
a through circuit unit for allowing the RF signal to pass therethrough under control of the RF amplification control circuit unit.
15
2. The low noise amplifier of claim 1, wherein the RF amplification control circuit unit compares an input level outputted from the detector with a reference level to allow the low noise amplification circuit unit or the through
20 circuit unit selectively to be in operation.
3. The low noise amplifier of claim 1, wherein the low noise amplification circuit unit is switched under control of the RF amplification control circuit unit, and
25 amplifies and outputs the RF signal inputted through the antenna when a weak electric-field signal is inputted.
4. The low noise amplifier of claim 1, wherein the through circuit unit is switched under control of the RF
30 amplification control circuit unit, and allows the RF signal inputted through the antenna to pass therethrough when a strong electric-field signal is inputted.
5. The low noise amplifier of claim 1, wherein the
35 RF amplification control circuit unit comprises a logic IC (Integrated Circuit) for comparing the input level outputted from an output terminal of the detector with the reference

level to output a high/low level signal.

5 6. The low noise amplifier of claim 5, wherein the RF amplification control circuit unit further comprises a switching unit connected to the logic IC, for switching depending on an output signal of the logic IC.

10 7. The low noise amplifier of claim 6, wherein the switching unit is a transistor having a base and an emitter connected to an output terminal of the logic IC, and a collector connected to the ground.

15 8. The low noise amplifier of claim 1, wherein the RF amplification control circuit unit comprises the logic IC for comparing the input level outputted from the detector with the reference level to output the high/low level signal, and allows the reference level at the time of outputting the high level signal to be different from the reference level at the time of the low level signal and allows the reference
20 level at the time of outputting the low level signal to be more than the reference level at the time of outputting the high level signal such that the reference level of the logic IC have a hysteresis characteristic.

25 9. The low noise amplifier of claim 1, wherein the low noise amplification circuit unit comprises:

 an amplifying unit for amplifying and outputting the RF signal inputted through the antenna;

30 a first diode connected between the antenna and the amplifying unit; and

 a second diode connected between the amplifying unit and the input tuner.

35 10. The low noise amplifier of claim 1, wherein the through circuit unit comprises:

 a first diode connected in parallel with the low noise amplification circuit unit and connected with the antenna;

and

a second diode connected between the first diode and the input tuner.

5 11. A logic low noise amplifier comprises:

an RF amplification control circuit unit for controlling an amplification of an RF (Radio Frequency) signal depending on electric field intensity of the RF signal;

10 a low noise amplification circuit unit for amplifying the RF signal under control of the RF amplification control circuit unit; and

a through circuit unit for allowing the RF signal to pass therethrough under the control of the RF amplification control circuit unit.

15 12. The logic low noise amplifier of claim 11, wherein the RF amplification control circuit unit further comprises a logic IC, and a switching unit connected with the logic IC.

20 13. The logic low noise amplifier of claim 11, wherein the low noise amplification circuit unit further comprises an amplifying unit, a first diode connected between the antenna and the amplifying unit, and a second diode connected between the amplifying unit and the input tuner.

25 14. The logic low noise amplifier of claim 11, wherein the through circuit unit further comprises a first diode connected in parallel with the low noise amplification circuit unit and connected with the antenna, and a second diode connected between the first diode and the input tuner.

30 15. The logic low noise amplifier of claim 11, wherein the RF amplification control circuit unit comprises the logic IC and the switching unit connected with the logic IC, and

wherein the low noise amplification circuit unit further comprises the amplifying unit and the first diode connected between the antenna and the amplifying unit, and the second diode connected between the amplifying unit and
5 the input tuner, and

wherein the through circuit unit is connected in parallel with the low noise amplification unit and further comprises a third diode connected with the antenna and a fourth diode connected between the third diode and the input
10 tuner.

16. A control method of an RF receiver having a low noise amplifier with a low noise amplification circuit unit, an input tuner, an amplifier and a detector, the control
15 method comprising:

a first step of checking an on/off state of the low noise amplification circuit unit;

a second step of comparing a control voltage with a reference level for turning off the low noise amplification circuit unit in case that the low noise amplification circuit unit is in the on state as a check result of the first step, and comparing the control voltage with a reference level for turning on the low noise amplification circuit unit in case that the low noise amplification circuit unit is in the off
20 state; and
25

a third step of selecting whether amplification or passage of the RF signal depending on the check result of the second step.

17. The control method of claim 16, further comprising a step of maintaining a current state and amplifying the RF signal in case that the low noise amplification circuit unit is in the on state as the check result of the first step and the control voltage is more than
30 the reference level for turning off the low noise amplification circuit unit as a check result of the second step.
35

18. The control method of claim 16, further comprising a step of outputting a switch control for turning off the low noise amplification circuit unit, and allowing the RF signal to pass through in case that the low noise amplification circuit unit is in the on state as the check result of the first step and the control voltage is less than the reference level for turning off the low noise amplification circuit unit as the check result of the second step.

19. The control method of claim 16, further comprising a step of maintaining the current state, and amplifying the RF signal in case that the low noise amplification circuit unit is in the off state as the check result of the first step and the control voltage is less than the reference level for turning on the low noise amplification circuit unit as the check result of the second step.

20. The control method of claim 16, further comprising a step of outputting a switch control for turning on the low noise amplification circuit unit, and amplifying the RF signal in case that the low noise amplification circuit unit is in the off state as the check result of the first step and the control voltage is more than the reference level for turning on the low noise amplification circuit unit as the check result of the second step.